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Subject:	Marine HABS in Puget Sound and outer coast- status of development of operational forecast tool (also for OA)
Date:	Tuesday, March 05, 2019 3:38:00 PM

Hi All,

I spoke with Steph Moore today from NOAA. I had fielded some questions from tribes at our harmful algae ID workshop this past fall on the status of a marine HABs early warning systems, and Steph has been involved with that type of analysis for the outer coast/Puget Sound. Given that our initial conversation was postponed due to the furlough, we just had a chance to touch base today. Below is an update that I thought you would be interested in, and Lesley, in particular in terms of how such a system could help with identifying significant events, potentially.

Outer coast Oregon and WA- nowcast (3-day advance) bulletins under development - they are based on the UW "LiveOcean" model and ORHABs data; NOAA's ESP (environmental sample processor) is providing coordinated data, and the model uses other data streams, toxin monitoring time series, upwelling trends, satellite chlorophyll, to help with the bulletins. The biggest unknown is connection between toxic cells offshore and beach sampling timing. The forecast product/bulletin will have green yellow red determination for beach status for e.g., razor clamming.

Within Puget Sound, there have been challenges with getting the bulletins developed for HABs https://faculty.washington.edu/pmacc/LO/LiveOcean.html . The goal is to provide 3-day nowcast bulletins for PS as well. However, they are missing ESP and flow cytobot data to help with the predictions - they have not been able to find support for the forecast system development, other than support for Soundtoxins (which helps coordinated in situ grab toxin samples). King county now has two flow cytobots that they run grab samples with every two weeks - samples are from a ½ dozen locations. The grab samples are not run in situ (lag b/c run on shore), but for at least one of the cytobot locations, now have pretty good quantitative phyto timeseries that could be combined with live ocean. Puget Sound is a diverse area, particularly given residence times may need several different ESP/cytobot sampling locations to come up with good predictions. Steph and Vera Trainer have submitted a proposal to deploy a cytobot in Sequim Bay, to analyze dinophysis dynamics at higher resolution (Vera previously identified connection to nutrients there).

Evelyn Lessard at UW also has an in situ flow cytometry cytobot now - setting up to deploy, but I think that is for the coast as well, not PS necessarily.

Note - CA has a clear relationship between domoic acid and Pseudo nitzschia with satellite products to develop an early warning forecast for the California current; this is more of a challenge in PS and coast in PNW due to clouds/satellite data availability.

Anyway, the above is food for thought, given the high level of interest expressed by tribes in R10.

Note that there are some OA predictions as well (Cheryl and Jill).

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